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30 ROCKEFELLER PLAZA NEW YORK, NY 10112			BRIER, JEFFERY A	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

		Application No.	Applicant(s)			
		10/615,941	TAKEMOTO ET AL.	TAKEMOTO ET AL.		
	Office Action Summary	Examiner	Art Unit			
		Jeffery A. Brier	2628			
Period fo	The MAILING DATE of this communication app or Reply	ears on the cover sheet v	vith the correspondence addres	is		
WHIC - Exte after - If NC - Failu Any	ORTENED STATUTORY PERIOD FOR REPLY CHEVER IS LONGER, FROM THE MAILING DANSIONS of time may be available under the provisions of 37 CFR 1.13 SIX (6) MONTHS from the mailing date of this communication. O period for reply is specified above, the maximum statutory period were to reply within the set or extended period for reply will, by statute reply received by the Office later than three months after the mailing ed patent term adjustment. See 37 CFR 1.704(b).	ATE OF THIS COMMUN 36(a). In no event, however, may a vill apply and will expire SIX (6) MO , cause the application to become A	ICATION.  I reply be timely filed  INTHS from the mailing date of this community ABANDONED (35 U.S.C. § 133).			
Status						
1)⊠	Responsive to communication(s) filed on <u>07 Au</u>	ugust 2007.				
2a)⊠	This action is <b>FINAL</b> . 2b) This	action is non-final.				
3)	Since this application is in condition for allowance except for formal matters, prosecution as to the merits is					
	closed in accordance with the practice under E	x parte Quayle, 1935 C.	D. 11, 453 O.G. 213.			
Disposit	ion of Claims					
4) 🖂	Claim(s) 1-3 and 5-18 is/are pending in the app	olication.				
•	4a) Of the above claim(s) is/are withdrawn from consideration.					
5)	Claim(s) is/are allowed.					
6)⊠	Claim(s) 1-3 and 5-18 is/are rejected.					
7)	Claim(s) is/are objected to.					
8)[	Claim(s) are subject to restriction and/o	r election requirement.				
Applicat	ion Papers					
9)[	The specification is objected to by the Examine	r.				
	The drawing(s) filed on is/are: a) acco		by the Examiner.			
	Applicant may not request that any objection to the	drawing(s) be held in abeya	ance. See 37 CFR 1.85(a).			
	Replacement drawing sheet(s) including the correct	ion is required if the drawin	g(s) is objected to. See 37 CFR 1.	.121(d).		
11)	The oath or declaration is objected to by the Ex	aminer. Note the attache	ed Office Action or form PTO-1	<b>52</b> .		
Priority (	under 35 U.S.C. § 119					
	Acknowledgment is made of a claim for foreign  ☐ All b)☐ Some * c)☐ None of:	priority under 35 U.S.C.	§ 119(a)-(d) or (f).			
a)	1.☐ Certified copies of the priority documents	s have been received				
	Certified copies of the priority documents		Application No.			
	3. Copies of the certified copies of the prior		···	ge		
	application from the International Bureau	(PCT Rule 17.2(a)).				
* (	See the attached detailed Office action for a list	of the certified copies no	t received.			
Attachmen	ut(e)					
_	ce of References Cited (PTO-892)	4) 🔲 Interview	Summary (PTO-413)			
2) Notice	ce of Draftsperson's Patent Drawing Review (PTO-948)	Paper No	o(s)/Mail Date Informal Patent Application			
	mation Disclosure Statement(s) (PTO/SB/08) er No(s)/Mail Date	6)  Other: _				

#### **DETAILED ACTION**

### Response to 08/07/2007 Amendment

1. The amendment filed on 08/07/2007 has been entered.

# Response to Arguments

2. Applicant's arguments filed 08/07/2007 have been fully considered but they are not persuasive for the following reasons.

The arguments concerning the 35 USC 112 first paragraph rejection have been fully considered but they are not persuasive because the claimed "real object" is similar to the objects in real space that are measured by stylus 1060 in order to determine the 3D coordinates of the constraining shape. See applicants specification at [0043], [0051], [0052], and [0079] (at line 5 note "constraining plane 2000 on the real object"). According to applicants specification points of the "real object" are received from stylus 1060 and are not received by moving the "real object". Alternative means for stylus 1060 are briefly mentioned in paragraphs [0028], [0041], [0050], [0068], and [0078], however, points of the "real object" would then be received from an alternative to stylus 1060 and would not be received by moving the "real object". Thus, applicants use in the originally filed specification of "object" with regards to real space and applicants use in the originally filed specification of "real object" defines "real object" differently than the amended claim define "real object", therefore, the originally filed specification does not convey that applicant moves the "real object" to obtain the points forming the constraining shape. The previous objection to the amendment filed 1/30/2007 with

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regards to the amendment to the specification and the 112 first paragraph rejection is maintained and reproduced below.

The arguments concerning the 35 USC 102 first paragraph rejection have been fully considered but they are not persuasive because as discussed by applicant in response to the 35 USC 112 first paragraph rejection and discussed in applicants specification at paragraphs [0028], [0041], [0050], [0068], and [0078] alternative means for stylus 1060 for inputting the 3D coordinates of the constraining shape is possible, thus, the claimed "inputting means for inputting three-dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user. the real object being capable of measuring the position and orientation in the real space" of claim 1; "an inputting step of inputting three dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user, the real object being capable of measuring the position and orientation in the real space" of claim 5; "obtaining three-dimensional position information of a plurality of positions designated by an operating unit moved by a user in the real space, the operating unit being capable of measuring the position and orientation" of claim 10; and "an inputting unit configured to input three-dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user, the real object being capable of measuring the position and orientation in the real space" of claim 16 may be means other than stylus 1060 which alternative means is taught by 6 DOF tracker device of Kitamura. Applicant amended the setting means of claim 1, the setting step of claim 5, the obtaining a constraining step of claim 10, and the setting unit Application/Control Number: 10/615,941

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of claim 16 to claim "constraining shape by using a shape generated based on the inputted (or obtained) three-dimensional information". The 6 DOF tracker device of Kitamura suggests using the 6 DOF tracker device to input 3D coordinates of the constraining shape since a means to input the constraining shape is inherently present and because the real object with inputted constrained properties is moved by the user using the 6 DOF tracker device which will allow for less input devices being used in Kitamura's system. Additionally section 2 at lines 7-14 states "To bring an object that already exist in the real world into a computer-generated virtual world, it is necessary to construct accurate shape representation of the real object in a computer system. A traditional method for this is to use conventional modeling software after precisely measuring the size or length of the real object by hand." which suggests using a computer input device to measure the real object in order to have accurate shape representation of the real object's constraining shape. The previous 102 rejection is therefore converted into a 103 rejection to address the amendments to the setting means of claim 1, the setting step of claim 5, the obtaining a constraining step of claim 10, and the setting unit of claim 16.

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## Response to 01/30/2007 Amendment

3. As discussed in the previous office action in paragraph 2 mailed on 05/07/2007, the amendment filed 1/30/2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material

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which is not supported by the original disclosure is as follows: the changes made to paragraph [0006] enters new matter because the "object" is not clearly limited to the stylus discussed at paragraph [0028]. Applicant is required to cancel the new matter in the reply to this Office Action.

# Claim Rejections - 35 USC § 112

- 4. The following is a quotation of the first paragraph of 35 U.S.C. 112:
  - The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
- 5. Claims 1-3, 5-9, and 16-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment to independent claims 1, 5, and 16 "input three-dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user" is not conveyed by the originally field disclosure because an object is different than the stylus discussed at paragraph [0028] that would be moved by the user. Currently applicant is claiming to move any real object while the application only supports moving stylus 1060. Figures 2, 10, and 12-14 shows stylus 1060 but do not convey that any real object may be moved to input three-dimensional position information.

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### Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  - 1. Determining the scope and contents of the prior art.
  - 2. Ascertaining the differences between the prior art and the claims at issue.
  - 3. Resolving the level of ordinary skill in the pertinent art.
  - 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- 8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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9. Claims 1-3 and 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshifumi Kitamura and Fumio Kishino, Consolidated Manipulation of Virtual and Real Objects, September 1997, Proceedings of the ACM symposium on Virtual reality software and technology, pages 133-138. Kitamura teaches an augmented reality system that uses object constraints to control the visual interaction between the virtual objects and the real objects.

A detailed analysis of the claims follows.

Claim 10:

Kitamura teaches an information processing method for changing the position and orientation of a virtual object in mixed reality space obtained by combining a real space and a virtual space, said method comprising the steps of:

obtaining three dimensional position information of a plurality of positions designated by an operating unit moved by a user in the real space (*In view of page 135 first paragraph under the heading of 5 Consolidated Manipulation Environment of Kitamura the same 6 DOF tracker device is used to control the position of a virtual world object(s) and to control the position of a constraining real world object(s) which is similar to applicants system where stylus 1060 is used to control the virtual world object(s) and to control the location of the constraining real world object(s), see applicants paragraphs [0028], [0030], and [0041]. The 6 DOF has a stylus the user moves which meets the "operating unit moved by a user in the real space" claim limitation.), the operating unit being capable of measuring the position and orientation in the real space (<i>The 6 DOF measures position and orientation in real space of the sylus on the 6 DOF.*);

determining an input of a constraining shape or an operation of the virtual object (The system determines if a shape having constraints is being input for the real object such as a toy block (section 4.1) or surface (section 5.4) or such as moving the real object which has a constraining shape and the system determines if the user is moving the virtual object.);

Kitamura does not fully teach: obtaining a constraining shape by using a shape generated based on the obtained three-dimensional position information in the case of the input of the constraining shape (The first paragraph in section 5 on page 135 describes the user using a 6 DOF tracker device to manipulate the virtual world objects and to position the constraining real world objects. The shape of the real world object(s) are used to constrain the movement of the virtual world object(s) by giving the real world object(s) a shape that the virtual world object(s) interacts with in a constrained manner. A step of inputting the shape of the real world objects constraining shape is inherently present.). Kitamura's use of the 6 DOF tracker device to control the position of the real world object suggests using the same 6 DOF tracker device to input the constraining shape of the real world object since this would require less input devices for the user to use and learn how to use. Additionally section 2 at lines 7-14 states "To bring an object that already exist in the real world into a computer-generated virtual world, it is necessary to construct accurate shape representation of the real object in a computer system. A traditional method for this is to use conventional modeling software after precisely measuring the size or length of the real object by hand." which suggests using a computer input device to measure the real object in order to have accurate shape

representation of the real object's constraining shape. Thus, it would have been obvious to one of ordinary skill in the art at the time of applicants invention to input with the 6 DOF tracker device the 3D coordinates of the constraining shape because the toy block (section 4.1) or surface (section 5.4) need to have their respective constraining coordinates input in order for the virtual object to properly interact with the real objects since this will require less input devices for the user to use and learn how to use and because section 2 at lines 7-14 suggests using a computer input device to measure the real object in order to have accurate shape representation of the real object's constraining shape. KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007), U.S. Supreme Court No. 04-1350 Decided April 30, 2007, 127 SCt 1727, 167 LEd2d 705.;

Kitamura further teaches changing the position and orientation of the virtual object according to instructions from the user, based on the obtained constraining shape as constraint condition in case of the operation of the virtual object (*The first paragraph in section 5 on page 135 describes the user using a 6 DOF tracker device to manipulate the virtual world object(s)*. The shape of the real world object(s) are used to constrain the movement of the virtual world object(s) by giving the real world object(s) a shape that the virtual world object(s) interacts with in a constrained manner. Sections 5.1 to 5.4 discusses manipulation of the virtual world object based upon constraint conditions based on the shape of the real world object in response to the user using the 6 DOF tracker device. The constraining shape generated from the three-dimensional position information constrains the interaction of the virtual world object with the real

world object, see sections 2, 4 to 5.4. The introduction on page 133 second full paragraph discusses augmented reality which synthesizes a virtual object with a real object. Section 5.1 discusses after movement is detected by the 6DOF manipulator the virtual object is moved according to the constraints.); and

combining an image of the virtual object generated according to the changed position and orientation, and the real image (*The introduction on page 133 second full paragraph discusses augmented reality which synthesizes a virtual world object with a real world object. Section 5.1 discusses after movement is detected by the 6DOF manipulator the virtual world object is moved according to the constraints of the real world object. Sections 2, 4, and 5 discusses mixing the virtual and real world images of virtual and real world objects.).* 

#### Claim 11:

Kitamura teaches an information processing method according to Claim 10, further comprising the step of combining a virtual image indicating the constraining shape with the real image (*The introduction on page 133 second full paragraph discusses augmented reality which synthesizes a virtual object with a real object. Section 5.1 discusses after movement is detected by the 6DOF manipulator the virtual object is moved according to the constraints. Sections 2, 4, and 5 discusses mixing the virtual and real world images of virtual and real world objects.).* 

#### Claim 12:

Kitamura teaches an information processing method according to Claim 10, wherein the constraining shape is a plane. (On page 136 in the text above figure 2 discusses

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determining a plane and using the plane to constrain movement of the virtual object is discussed with regards to figure 2.).

Claim 13:

Kitamura teaches an information processing method according to Claim 10, wherein said changing step changing the position and orientation of the virtual object is carried out by changing the position and orientation of the operating unit (*The 6 DOF tracker device is an operating unit. The user using the 6 DOF tracker device manipulates the virtual objects by changing the position and orientation of the 6 DOF tracker device.*).

Claim 14:

Kitamura teaches a computer program product comprising a computer readable medium storing computer program code for performing the information processing method according to Claim 10 wherein the information processing method is executed by a computer device (*This article is directed to computers that generate the augmented reality scene since it was published by ACM for a symposium on virtual reality software and technology and since at page 133 in the last sentence in the second paragraph of section 1 "software/hardware" is discussed. Software causing a computer to perform Kitamura's augmented reality is inherently stored in a computer readable recording medium.).* 

Claim 15:

Kitamura teaches a computer-readable recording medium, storing the computer program according to Claim 14 (*Software causing a computer to perform Kitamura*'s augmented reality is inherently stored in a computer readable recording medium.).

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Claim 16:

The functions of Kitamura corresponds to the claimed units because the software causes the computer to become a unit that performs a process. As seen below Kitamura performs the claimed processes.

Kitamura teaches an information processing device for aiding control operations relating to controlling the position and orientation of a virtual object, said device comprising:

an image capturing unit configured to capture a real image in real space (The measurements by the user in three dimensional real space, the device for obtaining the 3-D shape by using a range image, and the device for obtaining the 3-D shape by using multiple cameras captures a real image in real space. The three paragraphs found in section 2 on page 134 of Kitamura teaches the user measuring the real objects, a device measuring the real objects with range in response to the user, or a device measuring the real objects with multiple cameras range in response to the user. The claim does not limit the form of the real image, thus, Kitamura teaches this limitation. Note applicants paragraph [0024] does not restrict the image capturing unit to a particular type);

a virtual image generation unit configured to generate a virtual image of a virtual object according to the position and orientation of said image capturing unit (*Kitamura* 

discusses in section 2 in the first paragraph using conventional modeling software after precisely measuring the size or length of the real object by hand or by the devices which is an generation unit capable of generating three-dimensional positional information.

Sections 2, 4 and 5 discuss generating a virtual image(s) of a virtual object(s).);

a superimposing unit configured to superimpose the generated virtual image with the captured real image (Sections 2, 4, and 5 discusses mixing the virtual and real world images of virtual and real world objects.);

a determination unit configured to determine an input of a constraining shape or an operation of the virtual object (*The system determines if a shape having constraints is being input for the real object such as a toy block (section 4.1) or surface (section 5.4) or such as moving the real object which has a constraining shape and the system determines if the user is moving the virtual object.*);

an inputting unit configured to input three-dimensional position information of a plurality of positions inputted by a moving a real object in the real space by a user (In view of page 135 first paragraph under the heading of 5 Consolidated Manipulation Environment of Kitamura the same 6 DOF tracker device is used to control the position of a virtual world object(s) and to control the position of a constraining real world object(s) which is similar to applicants system where stylus 1060 is used to control the virtual world object(s) and to control the location of the constraining real world object(s), see applicants paragraphs [0028], [0030], and [0041]. The 6 DOF has a stylus the user moves which meets the "moving a real object limitation in the real space by a user" claim limitation.), the real object being capable of measuring the position and orientation

in the real space (The 6 DOF measures position and orientation in real space of the sylus on the 6 DOF.);

Kitamura does not fully teach: a setting unit configured to set a constraining shape by using a shape generated based on the inputting three-dimensional position information in the case of the input of the constraining shape (The first paragraph in section 5 on page 135 describes the user using a 6 DOF tracker device to manipulate the virtual world objects and to position the constraining real world objects. The shape of the real world object(s) are used to constrain the movement of the virtual world object(s) by giving the real world object(s) a shape that the virtual world object(s) interacts with in a constrained manner. A step of inputting the shape of the real world objects constraining shape is inherently present.). Kitamura's use of the 6 DOF tracker device to control the position of the real world object suggests using the same 6 DOF tracker device to input the constraining shape of the real world object since this would require less input devices for the user to use and learn how to use. Additionally section 2 at lines 7-14 states "To bring an object that already exist in the real world into a computergenerated virtual world, it is necessary to construct accurate shape representation of the real object in a computer system. A traditional method for this is to use conventional modeling software after precisely measuring the size or length of the real object by hand." which suggests using a computer input device to measure the real object in order to have accurate shape representation of the real object's constraining shape. Thus, it would have been obvious to one of ordinary skill in the art at the time of applicants invention to input with the 6 DOF tracker device the 3D coordinates of the

constraining shape because the toy block (section 4.1) or surface (section 5.4) need to have their respective constraining coordinates input in order for the virtual object to properly interact with the real objects since this will require less input devices for the user to use and learn how to use and because section 2 at lines 7-14 suggests using a computer input device to measure the real object in order to have accurate shape representation of the real object's constraining shape. KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007), U.S. Supreme Court No. 04-1350 Decided April 30, 2007, 127 SCt 1727, 167 LEd2d 705.; and

Kitamura further teaches an operating unit configured to control the position and orientation of the virtual object based on the constraining shape in accordance with the a user's instruction in case of the operation of the virtual object. (Sections 5.1 to 5.4 discusses manipulation of the virtual world object based upon constraint conditions based on the shape of the real world object in response to the user using the 6 DOF tracker device. The constraining shape generated from the three-dimensional position information constrains the interaction of the virtual world object with the real world object, see sections 2, 4 to 5.4. The introduction on page 133 second full paragraph discusses augmented reality which synthesizes a virtual object with a real object. Section 5.1 discusses after movement is detected by the 6DOF manipulator the virtual object is moved according to the constraints.).

### Claim 17:

Kitamura teaches an information processing device according to Claim 16, wherein the constraining shape is defined by polygons (*Figure 2's Cubes are formed* 

with polygons.) and the apexes of the polygons are at positions inputted by the user (As discussed in the a setting unit above it would have been obvious to use the 6 DOF tracker device to input the constraining shape of the real world object which would input the apexes of the constraining shape of the polygon.) or the constraining shape is a plane passing through the positions inputted by the user (A real sensed surface is a planar real world object whose position is inputted by the user in the setting unit. As discussed in the a setting unit above it would have been obvious to use the 6 DOF tracker device to input the constraining shape of the real world object which would input plane for a surface.).

# Claim 18:

Kitamura teaches an information processing device according to Claim 16, wherein said operating unit performs at least one of the following operations in performing an operation controlling the position and orientation of the virtual object:

a translation operation for causing translational movement of the virtual object based on the constraining shape (Page 137 column 1 lines 1-3 teaches translation when the virtual object collides with the real surface.); or

a rotation operation for rotating the virtual object on an axis which is a normal vector at a plane where the constraining shape and the virtual object come into contact (Page 137 column 1 lines 1-3 teaches rotation when the virtual object collides with the real surface.) (Page 137 column 1 lines 1-3 also teaches translation and rotation when the virtual object collides with the real surface).

Claims 1-3:

Means plus function claims 1-3 correspond to device claims 16-18 and the means of Kitamura, software and computer, are equivalent to applicant's means of software and computer.

Claims 5-7:

Step for claims 5-7 correspond to device claims 16-18 and the steps of Kitamura, software and computer, are equivalent to applicant's steps performed by software and computer.

Claims 8 and 9:

Claims 8 and 9 mirror claims 14 and 15 addressed above and they are rejected for the same reasons given above for claims 14 and 15.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A Brier whose telephone number is (571) 272-7656. The examiner can normally be reached on M-F from 7:30 to 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffery A. Brier/ Primary Examiner, Division 2628